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MEMORANDUM

SUBJECT: Antarctica Waste Disposal Practices

FROM: Sylvia K. Lowrance, Director
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TO: Brenda Sue Thornton
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The purpose of this memorandum is to provide comments from the Office of Solid Waste (OSW) on the Scientific Committee on Antarctic Research (SCAR) Panel of Experts recommendations concerning waste disposal practices in Antarctica. OSW agrees that the present Code of Conduct provisions concerning waste disposal are inadequate in some respects and need updating. In particular, the Code:

categorizes wastes by disposal method, rather than by waste characteristics and the degree of hazard they pose to the environment;

allows land and ocean dumping of untreated sewage, solid and even hazardous waste;

allows open burning and incineration without air emission controls.

OSW also generally agrees with the SCAR Panel of Experts recommendations, with some comments and suggestions for changes, as follow:

In general, the language of the recommendations and the present Code is too qualified and conditional (e.g., vague qualifiers like "discourage the use of," "where appropriate," and "take into account"). Additionally waste disposal standards should be incorporated under the Treaty as a new Agreed Measure to make them more binding.

Recommendation #3: To some extent, wastes continue to be categorized by disposal method, rather than by characteristics and degree of hazard they pose to the environment. We believe that wastes should be categorized in the following manner:

Waste water containing sewage, domestic waste, and other organic waste with BOD and mineral nutrients, that will be discharged to the land, ice, surface water, or ocean, is one class of waste. (This presently falls under class 1.) Hazardous waste should not be mixed with waste water.

Wastes that exhibit hazardous characteristics, regardless of whether they are liquids or solids, or combustible or noncombustible, are another class of waste (hazardous waste). (This roughly corresponds to class 2.) Within this class, hazardous waste may then be subdivided into combustibles, noncombustibles, liquids, and solids (2a, 2b, 2c, 2d). They must be managed, handled, stored, transported, and disposed of to prevent their release into the environment. Hazardous waste should not be mixed with waste water or nonhazardous solid waste.

Solid wastes that do not exhibit hazardous characteristics may then be divided into the two categories of combustible and noncombustible (Groups 3 and 4).

Radioactive wastes (Group 5), already are a separate waste class, and should not be mixed with any other type of waste prior to removal from Antarctica.

Recommendation #4: While waste management and disposal by each country should be designed to meet that country's national standards, universal minimum standards for Antarctic waste management are necessary in order to achieve uniform protection of the environment. It seems inequitable and futile to have some countries achieving high standards at considerable expense, while others, whose national environmental standards are low, escape these costs and contaminate the air, land, and water. Some mechanism also is necessary to make these universal minimum standards enforceable, such as incorporation under the Treaty as an Agreed Measure.

3. In light of Recommendation #4, U.S. waste disposal practices in Antarctica should conform to standards found in 40 CFR.

Hazardous Waste: Processes should be designed to minimize the generation of hazardous waste. Likewise, the purchase and import of virgin materials that will become hazardous waste should be minimized. Hazardous waste that does not meet Best Demonstrated Available Technology (BDAT) treatment standards cannot be land disposed (as defined in the Land Disposal Restrictions Standards in 40 CFR 268). If treated to BDAT standards onsite (For most hazardous waste, properly conducted

high temperature incineration often will achieve BDAT.), the residual may then be disposed on or in the land. However, the land disposal unit must meet 40 CFR 264 design requirements, with "minimum technology" such as double liners and a leachate collection system. Note that studies should be conducted to assess the efficacy and feasibility of "minimum technology requirements" in the Antarctic. Alternately (and preferably), the treatment/incineration residuals should be removed from Antarctica. Also, if incineration does not achieve the BDAT standard, waste must be removed from Antarctica. Hazardous waste incinerators must meet design and operation requirements specified at 40 CFR 264. Finally, hazardous waste subject to the Land Disposal Restrictions should be stored and accumulated only in tanks or containers prior to treatment/incineration or removal, and only for up to one year. (40 CFR 268.50)

Solid Waste: Waste minimization, of both solid and hazardous waste, should be emphasized in order to reduce the volume disposed of. Packaging materials that will become refuse should be minimized at the time of purchasing and supply. Ideally, purchase of plastics such as PVC, polyurethane, polystyrene should be minimized if these materials cannot be recycled. Materials should be recycled and recovered to the maximum extent possible (e.g., silver recovered from photographic waste). Combustibles should be incinerated separately from hazardous waste and only in double-burning high temperature incinerators with air emissions controls. (See 40 CFR 240-257 for solid waste management regulations.)

Waste Water: OSW believes that the Office of Water should comment on waste water treatment and discharge requirements. Nonetheless, we raise the following points for consideration and discussion: At isolated bases, treatment of waste water prior to discharge may be difficult or impossible. However, use of composting toilets, both at bases and stations, is a possible solution to sewage disposal. At coastal stations, primary treatment (physical maceration) alone is inadequate; waste water needs biological treatment to reduce BOD (with Rotating Biological Contactors (RBC) or equivalent) prior to discharge. Untreated sewage should not be discharged to the ocean. Despite the relatively low population of Antarctica, significant local impacts on the marine ecology could occur from discharge of untreated waste water. Furthermore, because ice-free land is scarce and the ecosystem rare, discharge to land also could significantly impact this ecosystem. Additionally, hazardous waste should not be mixed with waste water.

Ocean dumping of solid or hazardous waste, or untreated waste water (sewage) is prohibited in the U.S. (except for dredge and fill materials) and should be eliminated.

Despite the logistic problems caused by the remote location of Antarctic stations and bases, waste disposal standards should not be compromised, either for U.S. activities or for other countries' activities. This is especially true in Antarctica, where pristine ecosystems must be protected for their scientific value. Protective waste disposal standards can be achieved in Antarctica, although costs may be greater than in other parts of the world.

Please contact Dave Reeves at 382-4679 to discuss these comments further.

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